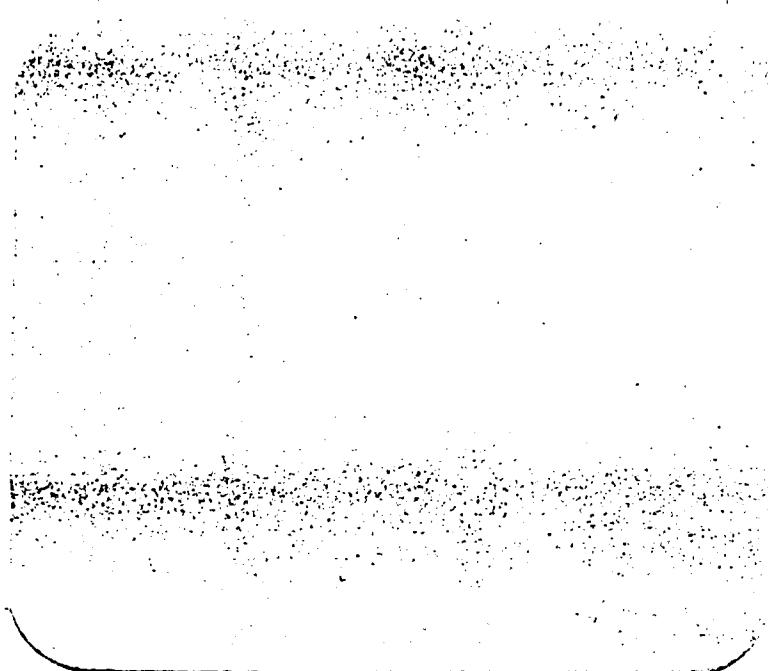


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CULTURE TRAINING: VALIDATION EVIDENCE  
FOR THE CULTURE ASSIMILATOR

Terence R. Mitchell, Dennis L. Dossett,  
Fred E. Fiedler,

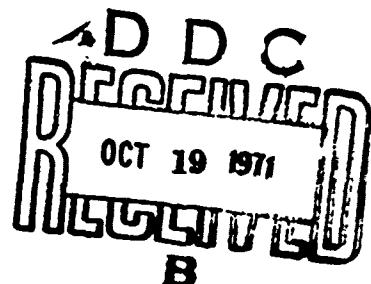
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Technical Report 71-28

August, 1971



Contract NR 177-472, N00014-67-A-0103-0012  
Office of Naval Research, Department of the Navy

Contract NR 177-473, N00014-67-A-0103-0013  
Advanced Research Projects Agency, Office of Naval Research

and

49  
Contract DA-~~40~~-193-MD-2060, Office of the Surgeon General

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**UNCLASSIFIED**

Security Classification

**DOCUMENT CONTROL DATA - R & D**

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) <b>Organizational Research Department of Psychology, University of Washington Seattle, Washington 98105</b>	2a. REPORT SECURITY CLASSIFICATION <b>Unclassified</b>
	2b. GROUP

3. REPORT TITLE <b>Culture Training: Validation Evidence for the Culture Assimilator</b>
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4. DESCRIPTIVE NOTES (Type of report and Inclusive dates)

**Technical Report 71-28, August, 1971**

5. AUTHOR(S) (First name, middle initial, last name)

**Terence R. Mitchell, Dennis L. Dossett, Fred E. Fiedler, and Harry C. Triandis**

6. REPORT DATE <b>August, 1971</b>	7a. TOTAL NO. OF PAGES <b>19</b>	7b. NO. OF PFFS <b>9</b>
8a. CONTRACT OR GRANT NO. <b>N00014-67-A-0103-0012 N00014-67-A-0103-0013</b>	9a. ORIGINATOR'S REPORT NUMBER(S) <b>71-28</b>	
b. PROJECT NO. <b>DA-49-193-MD-2060 177-472 49 177-473</b>	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	

10. DISTRIBUTION STATEMENT <b>Distribution of this document is unlimited.</b>	
11. SUPPLEMENTARY NOTES <b>none</b>	12. SPONSORING MILITARY ACTIVITY <b>Office of Naval Research, Dept. of Navy; Advanced Research Projects Agency, USN; and Office of the Surgeon General</b>

13. ABSTRACT  <b>The Culture Assimilator, a programmed self-instructional approach to culture training, is described, and a series of laboratory experiments and field studies validating the Culture Assimilator is reviewed. The results indicate that increased personal adjustment and better interpersonal relations between heterocultural groups are obtained for Assimilator training as compared to other traditional forms of culture training or no training. Productivity measures are less affected, although there is some evidence that the Assimilator training may help increase productivity as well.</b>
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**UNCLASSIFIED**

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Culture Assimilator culture training						

CULTURE TRAINING: VALIDATION EVIDENCE FOR  
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Abstract

The Culture Assimilator, a programmed self-instructional approach to culture training, is described, and a series of laboratory experiments and field studies validating the Culture Assimilator is reviewed. The results indicate that increased personal adjustment and better inter-personal relations between heterocultural groups are obtained for Assimilator training as compared to other traditional forms of culture training or no training. Productivity measures are less affected, although there is some evidence that the Assimilator training may help increase productivity as well.

CULTURE TRAINING: VALIDATION EVIDENCE FOR  
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There is substantial evidence that moving from one culture to another causes stress, anxiety and other psychological problems (see Triandis, 1967). In response to these issues a variety of training programs have been developed by government and industry to enable the individual to cope more effectively with a new and different culture. These range from brief interviews to extensive orientation programs conducted over a period of months, such as those used by the Peace Corps.

One approach is called the "Culture Assimilator," a programmed self-instruction instrument in book form (Fiedler, Mitchell, & Triandis, 1971). This technique was originally developed by Lawrence Stolurow, Charles Osgood, Harry Triandis, and Fred Fiedler, and the research using it has been conducted over the past seven years. The Assimilator is designed to be read in four to six hours, a practical approach to short-notice overseas assignments, and is presented in a format that is both enjoyable

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<sup>1</sup>This paper was supported by ARPA Order 454, Contract N00014-67-A-0103-013 with the Advanced Research Projects Agency, U.S. Navy (Fred E. Fiedler, Principal Investigator). Some of the research was also performed under the Advanced Research Projects Agency, ARPA 454, Office of Naval Research Contract NR 177-472, Nonr 1834(36) (Fred E. Fiedler and Harry C. Triandis, Principal Investigators), and under Contract DA-49-193-MD-2060 with the Office of the Surgeon General (Fred E. Fiedler, Principal Investigator). A somewhat shorter version of this paper was presented by Dossett and Mitchell at the American Psychological Association meetings in Washington, D.C. in September, 1971.

and informative about the host culture. The current authors have been involved in most of the research attempting to validate the Assimilator technique, and wish to present here a comprehensive review of all the empirical investigations that have used this approach.

A Culture Assimilator consists of a series of 75 to 100 short episodes briefly describing an intercultural encounter. These encounters describe situations that have had a marked effect on the attitudes of the individual about members of the other culture. The episodes are gathered from extensive interviews and are presented in the format of a multiple-choice question where the learner is asked to choose among four alternative explanations for the events presented in the episode. The learner chooses one and is directed to another page for immediate feedback and an explanation of why his choice was either correct or incorrect. If incorrect, he is directed back to the episode and must choose another explanation. If his choice is correct, the events in the episode and some principle which helps understand the host culture is explained, and he moves on to the next episode. These correct alternatives are generated from discussions with people from the host culture, questionnaire responses, and the reading of the social science literature about that culture.

A number of validation steps are also included. All episodes with alternatives are given to members of the other culture, who pick the alternative which they feel best represents the typical behavior of a member of their culture. They also judge all items as to importance and frequency of occurrence. The only episodes included in the Assimilator are those for which people from the other culture agree upon our

interpretation and its importance for cross-cultural understanding. An example of an item is presented below.

39-1

While working at the Air Force Base in Athens, Paul Lindgren was warned by a number of his friends about the Greeks. The friends told him that after he got to know some of the Greeks well, they would ask him to buy things for them at the PX. If Paul refused, he was told that the Greeks would get mad and the friendship would probably end.

Paul was prepared for the problem. When his Greek friend, Nikolas, asked him to get some cigarettes for him, Paul replied, "I would like to very much Nikolas. You know there is nothing that I wouldn't do for you if I could. However, they won't let me. They will punish me severely if they find out, and you wouldn't want that, would you?" Paul found that Nikolas was still his friend.

39-2

Paul's friendship with Nikolas was not ruptured, even though he could not get the cigarettes for him. How would you account for the persistence of their friendship?

1. Paul's American friends had misinformed him about the Greeks. Very few Greeks conform to their descriptions.

Go to page 39-3

2. Nikolas was probably a very understanding person, relative to most Americans and most Greeks.

Go to page 39-4

3. Paul had, in effect, assured Nikolas that he (Paul) was aware of his obligations to him.

Go to page 39-5

4. A request for cigarettes is too trivial a matter to rupture a friendship.

Go to page 39-6

39-3

You selected 1: Paul's American friends had misinformed him about the Greeks. Very few Greeks conform to their description.

No. Paul's American friends had not misinformed him. The friendship was not ruptured because of a strategy Paul used. Do you remember the nature of the ingroup - outgroup distinctions and their implications?

Try again.

Go to page 39-1

39-4

You selected 2: Nikolas was probably a very understanding person, relative to most Americans and most Greeks.

No. There is no information given in the episode to hint that Nikolas was any different from others. The key to the episode lies in the nature in which the boundaries of the outgroup are defined. Try again.

Go to page 39-1

39-5

You selected 3: Paul had, in effect, assured Nikolas that he (Paul) was aware of his obligations to him.

Yes. Paul's friendship with Nikolas made him a member of Nikolas' ingroup. Hence, he was required to make sacrifices for Nikolas and he could expect sacrifices from Nikolas in return. While Paul could not fulfill Nikolas' request (which would have been a sacrifice), he was wise enough to explain why he couldn't. Paul's explanation constituted an assurance that he still wished to belong to Nikolas' ingroup and that he would fulfill his obligations when it became possible to do so.

Go to page 40-1

39-6

You selected 4: A request for cigarettes is too trivial a matter to rupture a friendship.

No. This is definitely not true. A request for a cigarette can be more than enough to destroy a friendship. Re-examine the episode and try to see how Paul's working of his refusal served to save the friendship.

Go to page 39-1

Finally, items are categorized according to their content and bound together in book form. Two ordering principles are used: (a) across areas, in which the items go from the more general topics to more specific ones: (b) within a content area (e.g., the role of women), in which the sequence progresses from relatively easy items to more difficult ones (more subtle ones).

The program attempts to utilize the good points of programmed instructional materials. More specifically, the subject is actively involved in the learning process; he receives reinforcement and feedback about his performance. Also, since more than one episode is usually included to deal with a specific concept (e.g., "loss of face") the trainee may practice the knowledge he has gained.

To date, Culture Assimilators have been prepared for Thailand and Greece, as well as some countries of the Middle East and Central America. A more detailed summary of the steps involved for the construction of an Assimilator is presented elsewhere (Fiedler, Mitchell, & Triandis, 1971). The balance of this paper is devoted to a brief description of the laboratory and field studies conducted to validate the Culture Assimilator and a discussion of its implications for culture training. The results are summarized in Table 1.

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Insert Table 1 about here

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#### Laboratory Experiments

An experiment by Chemers, Fiedler, Lekhyananda, and Stolurow (1966) provided data on both group performance and interpersonal relations for culturally heterogeneous task groups. Twenty-four Army Reserve Officer Training Corps (ROTC) cadets served as leaders in groups composed of two volunteers each from the University of Illinois Arab Student Association and one ROTC cadet. Twelve of the American cadets were chosen randomly to receive Middle East Culture Assimilator training, while the other 12 received a control training program (also programmed instruction) of equal length dealing with Middle Eastern geography. Three different types of tasks were used, and post-test questionnaires provided evaluation of the socio-emotional climate and performance. The three tasks included: 1) a structured routing task which required the subjects to decide how to touch all points on a map in the shortest possible time; 2) an unstructured cooperative task which entailed writing a communication to Arabs concerning work habits in a village factory; and 3) a negotiation task which called for the group to decide on hiring practices for an Arab-American venture. The differences between culture and geography trained groups were all in the predicted direction, and the group climate scores for two of the tasks were statistically significant. There was also a trend for Assimilator training to improve group performance.

Mitchell and Foa (1969) administered a Thai Culture Assimilator to 16 ROTC cadets of a Special Forces Company, while another 16 cadets

TABLE 1

## Summary Table of Field and Laboratory Studies\*

Study	Assimilator	Subjects	Conditions	N	Performance	Adjustment	Interpersonal Relations	Effect of Training
Chemers, Fiedler, Lekhyananda, & Stolurrow (1966)	Iran	Army ROTC	Assimilator	12	trend favoring Assimilator	P < .05		
Mitchell & Foa (1969)	Thailand	ROTC cadets	Assimilator	16	NS		P < .05, but NS for non-Thai member	
Chemers (1969)	Iran	Oil Company executives, teachers, students, culture society members	Assimilator	24	NS		significant interaction w/ task order and leadership style	Assimilator Ss learned more culture related items
O'Brien, Fiedler, & Hewitt (1971)	Honduras	American teenagers	Assimilator	119	P < .05	P < .05		
Worcheil & Mitchell (1970)	Thailand	Air Force & Civilian Advisors	Assimilator	146			trend favoring Assimilator	Assimilator liked better & more helpful (p<.01)
Worcheil & Mitchell (1970)	Greece	Army personnel	Assimilator	14	specific questions: P < .01 composite: NS	specific question: P < .01 composite: P < .05	specific question: P < .01 composite: P < .05	
Dossett & Mitchell	Thailand	Peace Corps volunteers	Assimilator	12	Skills composite: No training	Composite: P < .05 - Supervisor rating	Language ability composite: NS	

\*All significant differences favor Assimilator-trained groups over other groups.

received geography training. ... 32 cadets were matched according to rank and randomly assigned to the two conditions. Sixteen pairs of Far Eastern students (one of each pair was Thai) worked under the direction of an American leader in each condition. That is, each pair of foreign students worked with two Americans, one who was culture trained, one who was geography trained. The leader's task was to supervise his team in constructing a toy building as quickly and as accurately as possible without working on it himself. A Thai observer and each group member completed an evaluation form following the first task, and then the observer and the Far Eastern students performed a similar task with a new leader. The questionnaire consisted of a number of semantic differential type scales dealing with both the interpersonal relations and perceived effectiveness of the group. The design was counterbalanced to control for the two observers, the sequencing of the two tasks, and the two leader training conditions. Neither the observers nor the Far Eastern students knew the training conditions of the Americans with whom they worked.

Observers, American leaders, and Thai team members rated interpersonal relations for Assimilator trained leaders as significantly better than for geography trained leaders. The same raters indicated no significant difference in performance. Non-Thai group members saw no difference in either performance or interpersonal relations, suggesting that this Assimilator may be culture specific and not necessarily generalizable to other Far Eastern cultures.

#### Field Experiments

A field experiment was conducted in Iran by Chemers (1965). Forty-eight American Ss living in Teheran participated, as well as 96 Iranian

volunteers, so each group was composed of one American leader and two Iranians. Half of the 48 Americans received Assimilator training and half did not. One of the two tasks completed by each group involved group proposals for a campaign to spread technological information into the provinces of Iran. The other task required negotiating until consensus was reached on three family problems. The American leader and his two Iranian group members were instructed to try to bring the group decision as close as possible to that which would be valued in their own culture. More successful leaders thus produced group decisions closer to the American position. The decisions reached on both tasks were evaluated by four American and four Iranian judges. Task order was counterbalanced in the design.

The effectiveness of Assimilator training over geography training was measured by pre- and post-training tests designed to measure prior familiarity with the culture material. A significantly greater mean number of items was learned by the Assimilator group.

The results showed no main effects on group climate measures, but there was an interaction between training and leadership style (LPC, see Fiedler, 1967) with task-oriented, Assimilator trained leaders producing the most favorable group climate scores. There were no main or interaction effects on performance measures in the cooperative task, and no main effects on performance in the negotiation task. An interaction between training and task order indicated greatest effectiveness for Assimilator trained Ss when the cooperative task preceded the negotiation task.

O'Brien, Fiedler, and Hewitt (1970) reported a study in Honduras

which used an Assimilator containing a large number of task-oriented items as well as the usual cultural information. These former items dealt with possible cross-cultural conflicts in the specific settings (e.g., hospital clinics) where the Ss would work. The participants in the experiment were 265 young Americans who were to spend a summer in Honduras working in local clinics and on local community projects. During training 119 Ss in the experimental group were randomly selected to read the Central American Culture Assimilator. The culture training which was routinely administered by the sponsoring agency was provided to the remaining 146 Ss. The Assimilator was not emphasized and appeared to be a normal part of the training program. Adjustment measures were obtained from the Americans, both before and after their experience in Honduras, and on daily rating forms during their stay. Performance ratings were made by the program director and his staff.

Assimilator trained Americans showed significantly greater improvement in performance and adjustment than their control counterparts with the same effect evident as a trend for satisfaction measures. For both performance and adjustment, the effect was even greater for Americans who had returned to Honduras for a second summer of duty. Thus, it appears that the Culture Assimilator can help integrate previous experiences as well as easing one's first contact with a foreign culture. The inclusion of task-relevant items may also enhance performance, as these data suggest.

The evaluation of an Assimilator for Thailand is reported by Worchel and Mitchell (1970). Twenty-three U.S. Air Force Advisors and 28 civilian advisors took part. Ss within each group were randomly assigned to training conditions so that six military and nine civilian advisors read

the Thai Assimilator, while nine military and twelve civilian Ss, respectively, read a booklet containing four essays covering religion, history, customs, and Thai childrearing practices.

Responses to a 17-item questionnaire were gathered two to three months after the training. The questions dealt with four general areas: 1) liking of the Assimilator; 2) perceived productivity; 3) adjustment; and 4) interpersonal relations.

The Assimilator Ss liked their training better and thought it more helpful than the essay Ss ( $p < .01$ ); the same relationship held for the perceived productivity scores ( $p < .01$ ). Assimilator training produced somewhat better perceived adjustment to the culture ( $p < .06$ ), and a trend favoring the Assimilator was evident in perceived effectiveness of interpersonal relations with members of the host culture.

Worchel and Mitchell (1970) also reported a study of 76 U.S. Army personnel in Greece. Fourteen men were randomly assigned to the Assimilator group while the remainder constituted the control or no-training group. A 17-item questionnaire similar to that used in the Thai study was given to all Ss three months after Assimilator training. Three questions dealt specifically with productivity, adjustment, and interpersonal relations. Three composite scores were also formed from the questionnaire items reflecting these dimensions of intercultural adjustment. The results indicated that five of the six measures (excepting the performance composite) were significantly in favor of the Culture Assimilator training.

A final study was conducted on U.S. Peace Corps volunteers in Thailand using the Thai Assimilator and a control group which received the usual Peace Corps culture training program. Self-ratings, American supervisor

ratings and Thai counterpart ratings were obtained using a questionnaire designed and distributed by the University of Hawaii Peace Corps Training Center to evaluate its overall training program. The present authors (Dossett & Mitchell) attempted to form composite ratings of skill level, language ability, and adaptation from the questionnaire responses, although the questionnaire items were poorly suited for testing the two methods of culture training. In rater-by-training analyses of variance, a significant rater effect was noted for skill and language composites ( $p < .001$ ). More specifically, the Thais felt that the Americans had significantly better language ability than the trainees or supervisors believed they had. Also, the trainees felt they had significantly higher skill levels than the estimate made by the Thais or supervisors. Finally, for the nine possible training comparisons (three raters by three composites) seven were in the direction favoring the Assimilator; but only the adaptation composite reached an acceptable level of significance ( $p < .05$ ). The authors felt that this slight degree of support was partly attributable to the inadequacy of the measurement instrument used.

#### Discussion

These studies show that the Culture Assimilator is an effective method of decreasing some of the stress experienced when one works with people from another culture. In general, personal adjustment and interpersonal relations in heterocultural groups are enhanced by this form of culture training. Performance measures have shown somewhat less response to Assimilator training, although one field study indicates that the inclusion of task-oriented items in the Assimilator may indeed help increase productivity.

Certainly many questions remain to be answered about cultural training. It is clear, for example, that we have emphasized cultural differences in our approach. Perhaps a better approach would be to talk about similarities in some of the values of the two cultural groups and to present the differences in behavior as different ways to reach similar goals. The vast social psychological literature which shows that similarity leads to attraction could, thus, be incorporated into the training. Problems of sequencing of the ideas also remain to be investigated. Preliminary research by Triandis and his associates suggests that presenting differences and then similarities leads to greater attraction for members of the other culture than other combinations of sequencing.

Another issue for further investigation is the time of training. Is it better to give the program before one travels to another country or three weeks after he arrives? Perhaps some combination is optimal. What sorts of programs might supplement the Assimilator? The field for further studies is open and, hopefully, further investigations will shed light on these questions.

## References

Chemers, M. M. Cross-cultural training as a means for improving situational favorableness. Human Relations, 1969, 22, 531-546.

Chemers, M. M., Fiedler, F. E., Lekhyananda, D., & Stoluwrow, L. M. Some effects of cultural training on leadership in heterocultural task groups. International Journal of Psychology, 1966, 1, 257-270 and 301-314.

Fiedler, F. E. The effect of leadership and cultural heterogeneity on group performance: A test of the Contingency Model. Journal of Experimental Social Psychology, 1966, 2, 237-264.

Fiedler, F. E. A Theory of Leadership Effectiveness. New York: McGraw-Hill, 1967.

Fiedler, F. E., Mitchell, T. R., & Triandis, H. C. The Culture Assimilator: An approach to cross-cultural training. Journal of Applied Psychology, 1971, 55, 95-102.

Mitchell, T. R., & Foa, U. G. Diffusion of the effect of cultural training of the leader in the structure of heterocultural task groups. Australian Journal of Psychology, 1969, 21, 31-43.

O'Brien, G. E., Fiedler, F. E., & Hewett, T. The effects of programmed culture training upon the performance of volunteer medical teams in Central America. Human Relations, 1971, 24, 209-231.

Triandis, H. C. Interpersonal relations in international organizations. Organizational Behavior and Human Performance, 1967, 2, 26-55.

Worchel, S., & Mitchell, T. An evaluation of the effectiveness of the Thai and Greek Culture Assimilators. Seattle, Wash.: Organizational Research Group, University of Washington, 1970.

UNCLASSIFIED

Security Classification

## DOCUMENT CONTROL DATA - R &amp; D

(Security classification of title, body of abstract and indexical annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) POLYTECHNIC INSTITUTE OF BROOKLYN DEPT AEROSPACE ENGINEERING & APPLIED MECHANICS ROUTE 110, FARMINGDALE, NEW YORK 11735		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED
2b. GROUP		
3. REPORT TITLE  AN ALTERNATING DIRECTIONAL IMPLICIT SCHEME FOR THREE-DIMENSIONAL HYPERSONIC FLOWS		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Scientific Interim		
5. AUTHOR(S) (First name, middle initial, last name) C T NARDO R J CRESCI		
6. REPORT DATE 31 Jan 1972	7a. TOTAL NO. OF PAGES 17	7b. NO. OF REFS 8
8. CONTRACT OR GRANT NO AF 49(638)-1623	9a. ORIGINATOR'S REPORT NUMBER(S)	
9. PROJECT NO. 9781-01	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned to this report) AFOSR - TR - 72 - 0297	
10. DISTRIBUTION STATEMENT  Approved for public release; distribution unlimited.	11. SUPPLEMENTARY NOTES JOURNAL Journal of Computational Physics v8 n2 pp268-284 Oct 1971	
12. SPONSORING MILITARY ACTIVITY AF Office of Scientific Research (NAM) 1400 Wilson Boulevard Arlington, Virginia 22209		13. ABSTRACT  A theoretical and experimental investigation has been conducted of the behavior of steady low-density hypersonic flow over a finite-width flat plate. The theoretical analysis, previously hampered by stability problems which dictated small streamwise increments, has been modified within the framework of the original formulation of Rudman and Rubin, in such a manner that larger streamwise increments are now possible without severe stability restrictions. This has been made possible by employing an alternating directional implicit numerical scheme developed by Peaceman and Rachford, such that the Rudman-Rubin analysis is now extendable downstream into the strong interaction region with smaller computational times. Simultaneously, an experimental program was conducted to compare with the theoretical predictions. Measurements of pitot pressure and hot wire output (mass flow and temperature profiles) were obtained for a Reynolds number of 300/inch and a temperature ratio ( $\bar{T}_w/\bar{T}_{s,0}$ ) of 0.3. Profiles of density, velocity, and temperature ratios in the merged layer were obtained and compared to the theoretical analysis. Good agreement is shown to exist through the merged layer region.

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